

each well on the freeboard deck and on the raised quarterdeck must be at least as great as A in the following formulas:

(1) Where the length of bulwark (l) in the well is 66 feet or less, $A=7.6+0.115 (l)$

(2) Where (l) exceeds 66 feet, $A=0.23 (l)$ but (l) need in no case be taken as greater than 0.7L.

(c) In ships having erections on deck that are open at either or both ends, provision for freeing the space within such erections must be approved by the Commandant or the assigning authority.

(d) The lower edges of the freeing ports must be as near the deck as practicable. Two-thirds of the freeing port area required must be provided in the half of the well nearest the lowest point of the sheer curve.

(e) All freeing port openings in the bulwarks must be protected by rails or bars spaced approximately 9 inches. If shutters are fitted to freeing ports, ample clearance must be provided to prevent jamming. Hinges must have pins or bearings of noncorrodible material. If shutters are fitted with securing appliances, these appliances must be of approved construction.

(f) The minimum freeing port area for each well on superstructure decks must be one-half of the area required by paragraph (b) of this section.

§ 45.119 Freeing port area: Changes from standard sheer.

The freeing port area required by § 45.117(b) must be multiplied by the factor in the following table 5 if the sheer differs from the standard sheer defined in § 45.63. Table 4.

TABLE 5
Freeing port area: Sheer correction.

| Ratio of sums of actual sheer ord./std. sheer ord. Greater than: | Multiplier for area required by § 45.117(b) |
|--|---|
| 1.0 | 1.0 |
| 1.0 | 1.00 |
| 0.9 | 1.05 |
| 0.8 | 1.10 |
| 0.7 | 1.15 |
| 0.6 | 1.20 |
| 0.5 | 1.25 |
| 0.4 | 1.30 |
| 0.3 | 1.35 |
| 0.2 | 1.40 |
| 0.1 | 1.45 |
| No sheer | 1.50 |

§ 45.121 Freeing port area: Changes for trunks and side coamings.

If a vessel has a trunk and does not meet the requirements of § 45.61 or has continuous or substantially continuous hatchway side coamings between detached superstructures, the minimum area of the freeing port openings must be obtained from the following table:

| Breadth of hatchway or trunk in relation to the breadth of ship | Area of freeing ports in relation to the total area of the bulwarks (percent) |
|---|---|
| 40 percent or less | 20 |
| 75 percent or more | 10 |

The area of freeing ports at intermediate breadths must be obtained by linear interpolation.

§ 45.123 Freeing port area: Changes for bulwark height.

(a) For the purposes of freeing port area only, bulwark height is considered standard at 24 in for ships 240 ft in length and less; and 48 in for ships 480 ft in length or greater. The standard bulwark height for ships of intermediate length is obtained by direct interpolation.

(b) If the bulwark is more than standard height, the area required by § 45.117 must be increased by 0.04 square feet per foot (ft²/ft) of length of well for each foot difference in height.

(c) For ships greater than 480 ft in length that have an average bulwark height less than 3 ft, the area required by § 45.117 may be decreased by 0.04 ft²/ft of length for each foot difference in height.

§ 45.125 Crew passageways.

The vessel must have means for protection of the crew from boarding seas such as life lines, gangways, and underdeck passages to facilitate passing between their quarters and machinery spaces and other spaces essential to the operation of the ship.

§ 45.127 Position of structures, openings, and fittings.

For the purposes of this part—

§ 45.129

(a) *Position 1* means in an exposed position on—

(1) The freeboard deck or a raised quarter deck;

(2) A superstructure deck or a trunk deck and forward of a point $\frac{1}{4} L$ from the forward perpendicular; or

(3) A trunk deck whose height is less than H_s .

(b) *Position 2* means—

(1) On a superstructure deck aft of a point $\frac{1}{4} L$ abaft the forward perpendicular; or

(2) On a superstructure and trunk combination, that is H_s or more in height, aft of a point $\frac{1}{4} L$ abaft the forward perpendicular.

§ 45.129 Hull fittings: General.

Hull fittings must be securely mounted in the hull so as to avoid increases in hull stresses and must be protected from local damage caused by movement of equipment or cargo.

§ 45.131 Ventilators.

(a) Ventilators passing through superstructures other than enclosed superstructures must have coamings of steel or equivalent material at the freeboard deck.

(b) Ventilators in position 1 must have coamings at least 30 in. above the deck and ventilators in position 2 must have coamings at least 24 in. above the deck. The Commandant or the assigning authority may also require coamings in other exposed positions.

(c) Ventilators in position 1 or 2 to spaces below freeboard decks or decks of enclosed superstructures or trunks must have coamings of steel permanently connected to the deck and any ventilator coaming that is more than 36 in. high must be specially supported.

(d) Except as provided in paragraph (e) of this section ventilator openings must have weathertight closing appliances that are permanently attached or, where approved by the Commandant or the assigning authority conveniently stowed near the ventilators to which they are to be fitted.

(e) Ventilators in position 1, the coamings of which extend to more than 12.5 ft above the deck, and in position 2, the coamings of which extend to more than 6 ft above the deck, need not

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have closing appliances unless specifically required by the Commandant.

§ 45.133 Air pipes.

(a) Where an air pipe to any tank extends above the freeboard or superstructure deck—

(1) The exposed part of the air pipe must be made of steel and of sufficient thickness to avoid breaking from impact of boarding seas.

(2) The air pipe must have a permanently attached means of closing its opening; and

(3) The height from the deck to any point where water may obtain access below deck must be at least 30 in above the freeboard deck, 24 in above raised quarter decks, and 12 in above other superstructure decks.

(b) If the height required in paragraph (a) of this section interferes with working the ship, the Commandant may approve a lower height after considering the closing arrangements.

§ 45.135 Hull openings at or below freeboard deck.

Closures for hull openings at or below the freeboard deck must be as strong as the structure to which they are attached and must be watertight.

§ 45.137 Cargo ports.

(a) Unless otherwise authorized by the Commandant, the lower edge of any opening for cargo, personnel, machinery access, or similar opening in the side of a ship must be above a line that is drawn parallel to the freeboard deck at side and has as its lowest point the upper edge of the uppermost loadline.

(b) The number of cargo ports in the sides of a ship must be—

(1) No more than the minimum necessary for working the ship; and

(2) Approved by the Commandant.

§ 45.139 Side scuttles.

(a) The sill of each side scuttle must be above a line that is drawn parallel to the freeboard deck at side having its lowest point 2.5 percent of the breadth or 20 in above the summer load waterline, whichever is higher.

(b) Except as provided for in paragraph (c) of this section, each side scuttle to a space below the freeboard deck,